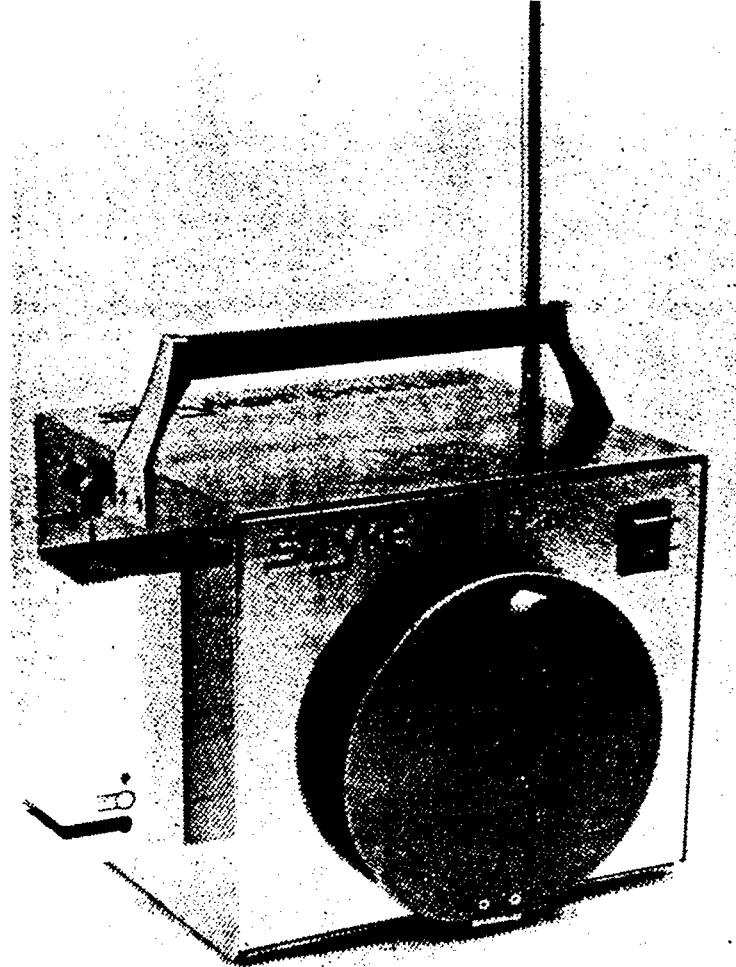


stryker®

OrthoLav 202-100

Government Model



Operator / Maintenance Manual

TABLE OF CONTENTS

Introduction	2
Operation	3-6
Figure 1	3
Figure 2	3
Figure 3	4
Figure 4	4
Figure 5	4
Figure 6	5
Figure 7	5
Figure 8	6
Periodic Maintenance	7
Cleaning	8
Maintenance	8-9
Storage/Transportation	9
Trouble Shooting	9-10
User/Patient Safety	10
230V Conversion	11
Figure 9	11
Source Cord Plug Cap Exchange	12
Figure 10	12
Figure 11	12
Circuit Description	13
Wiring Diagram	14-15
PC Board Assembly	16-17
Pneumatic Diagram	18
Parts List and Assembly Drawing	19-22
Specifications	23
Reorder Information	23
Limited Warranty	24
Limited Copyright Release	24

WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. The words WARNING, CAUTION and NOTE carry special meanings and should be carefully reviewed.

WARNING: The personal safety of the patient may be involved. Disregarding this information could result in injury to the patient.

CAUTION: These instructions point out special service procedures or precautions that must be followed to avoid damaging the instrument.

NOTE: This provides special information to make maintenance easier or important instructions clearer.

INTRODUCTION

Pulsed irrigation is used to cleanse and debride tissue.

The principle upon which pulsed irrigation works is that a pulse of fluid will compress tissue and, during the interpulse phase, the tissue will spring back freeing loose particles and debris. The next pulse will wash the debris and foreign particles away.

The Stryker OrthoLav Pulsed Irrigation and Suction System produces distinct jets of water with an interpulse phase to allow for tissue compression and decompression.

The Large Handpiece Tubing Set and some tips also have a suction lumen so the irrigation from the pulsation can be removed. This is important so the pulsation can continue to compress the tissue and not splash irrigant.

The Stryker OrthoLav Pulsed Irrigation and Suction System consists of:

The OrthoLav Unit: An electrically powered motor with a patented concentric wheel that pumps fluid at the rate of 1000 pulses/min. Each pulse is 1 ml in volume.

The Large Handpiece and Tubing Set: The handpiece possesses finger tip control for irrigation and suction. The irrigation activation hole is recessed to prevent inadvertent activation. The suction control allows intermittent or constant evacuation. The tubing provides a closed, sterile fluid path from I.V. to patient.

Tips: All tips haveatraumatic suction capability and will not clog or grab tissue. Tips are available with single orifice for a central stream of irrigant and an operating PSI of 60-70; or with multiple orifices for wider irrigant dispersion and an operating PSI of 30-40. See Reorder Information (p. 23) for a complete list of available tips.

The Stryker OrthoLav Pulsed Irrigation and Suction System will offer unparalleled bone cleaning and tissue debriding when used properly.

Please take the time to read and understand these instructions before use. For further information contact your Stryker representative or call Stryker Corporation (1-800-253-3210 / 1-800-446-3703 in Michigan).

OPERATION

WARNING: Prior to use pump unit and components should be operated and inspected for any damage. DO NOT use if damage is apparent.

1. Place pump unit on a table near, but outside, sterile field of surgical site.
2. Using sterile procedure drop contents of tubing set pack into sterile field. Repeat procedure for tip of choice.
3. Keep handpiece portion of tubing set within sterile field and pass remaining portion of tubing set for installation into pump unit.
4. Open pump cover and roll large portion of irrigation tubing, with white connector, around pump roller head. See figure 1.



Figure 1.

5. Insert white connector into slot. See figure 2.



Figure 2.

6. Close pump cover. Push in and twist latch to secure.
7. Turn power switch on front of unit to ON position. Place pinch clamp switch in UP position and insert small portion of irrigation tubing. Release pinch clamp switch to DOWN position to secure tubing. See figure 3.

NOTE: Holding pinch clamp switch in up position for six seconds or longer may result in tripping circuit breaker. Reset circuit breaker. See figure 4.

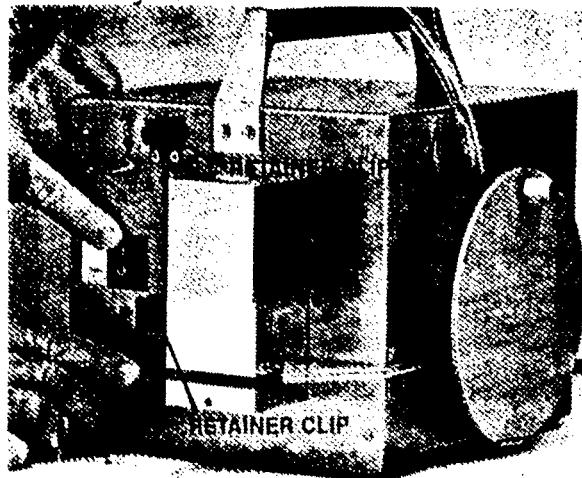


Figure 3

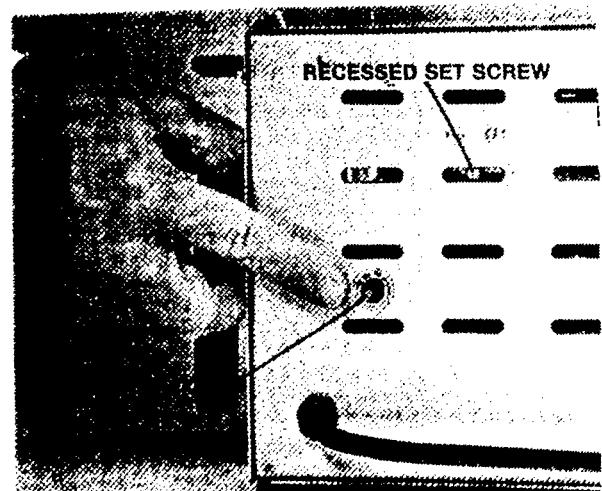


Figure 4

8. Turn power switch OFF to prevent inadvertant operation of unit while completing the tubing connection. Place small irrigation tubing behind the two retainer clips. See figure 3.

9. Attach the suction line tube of tubing set to the hospital suction hookup. See figure 5. Figure 5

NOTE: Always use a suction cannister between the Stryker tubing set and suction source.

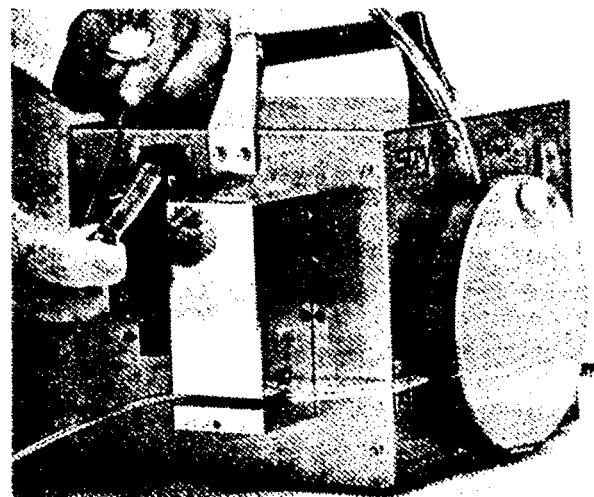


Figure 5

10. Place irrigation control filter onto irrigation control hole.
See figure 6.

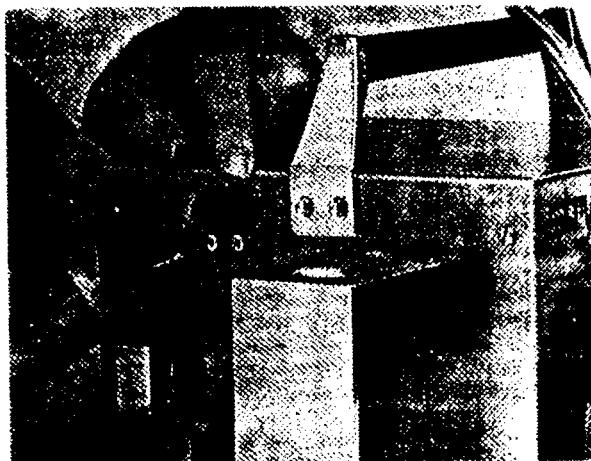


Figure 6

11. Spike irrigation source. See figure 7.

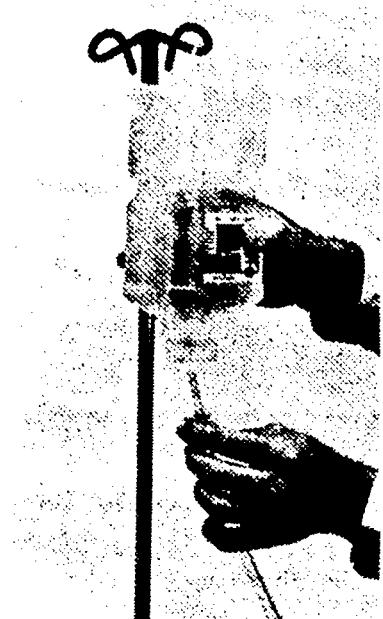


Figure 7

12. Turn pump unit on.

13. To activate irrigation place finger over irrigation control hole on handpiece. Remove finger from hole to stop irrigation. See figure 8.

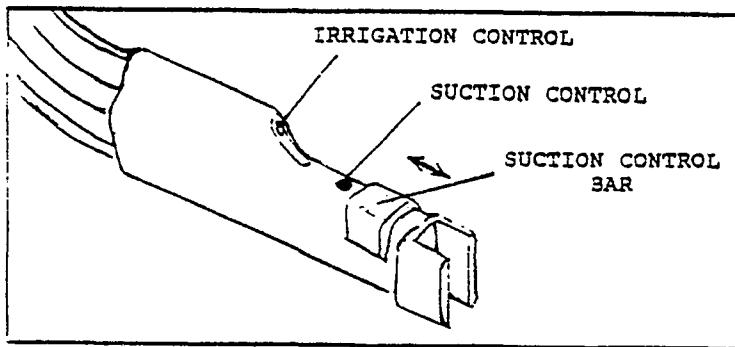


Figure 8

14. To activate suction place finger over suction control hole on handpiece. Remove finger from hole to stop suction. For continuous suction slide suction control bar over suction control hole. Slide suction control bar forward to discontinue continuous suction. See figure 8.

ORTHOLAV

Periodic Maintenance

ITEM	PERIOD	METHOD
Pump Operation	Annually	Hold finger over irrigation control hole. Motor should come on and solinoid should lift.
Source Cord	Annually	Check for cracks and replace as needed.
Leakage Current	Annually	Using a safety analyzer verify leakage current under 100 MicroAmps

CLEANING

1. Unplug pump unit before cleaning.
2. Use a sponge dampened in soapy water or disinfectant to clean all external areas of pump unit. DO NOT allow liquids to splash inside the unit.
3. DO NOT IMMERSE any portion of pump unit.
4. Tubing tips are sterile disposables and designed for single use only. DO NOT resterilize or reuse.

MAINTENANCE

Upon initial receipt, remove pump unit from package. Retain original package for future use.

No initial receipt, remove pump unit from package. However, it is suggested that prior to use pump should be operated and inspected for any damage. DO NOT use if damage is apparent.

CAUTION: Maintenance procedures to be performed by qualified service personnel only.

CAUTION: DO NOT autoclave pump unit.

CAUTION: DO NOT immerse pump unit in any liquid.

CAUTION: DO NOT modify electrical ground of pump unit.

Operational Performance

A. Cycles per minute: 1140 CPM

B. Volume per minute: 1 liter using 280-14-500 tube set and 280-14-620.

C. Duty Cycle:

60 Hz - Continuous operation

50 Hz - To ensure safe operating temperatures, Stryker Surgical Division recommends a maximum duty cycle of 10 MINUTES ON AND 30 MINUTES OFF WITH UNLIMITED repetitions.

D. Door latching

1. Must operate freely.

2. Must remain latched while pump unit is in operation.

E. Pump unit should not rattle while in operation.

F. With pump unit operating switch in ON position check to ensure:

1. Solenoid pinch valve operates in coordination with block of filter control line.

2. Pinch clamp switch on side of pump unit properly activates pinch valve.

NOTE: Holding pinch clamp switch in UP position for six seconds or longer may result in tripping circuit breaker. Reset breaker.

Safety Check

- A. Spot check electrical connections.
 - 1. Solder joints
 - 2. Screw or slide terminals
- B. Spot check cabinet screws for tightness.
- C. Dielectric Test:
1500 volts for one second to be checked prior to connection to solid state switch.
- D. Ground continuity check: 0.10 OHMS maximum
- E. Leakage current: less than 100 Microamps
- F. Pump unit should not run with door open.
- G. All internal components (motor, relays, transformer, switches, diodes, resistors) to be mounted securely.
- H. All internal wiring and soldering to be neat and secure.

STORAGE/TRANSPORTATION

To insure longevity and performance of pump unit, package in original packaging materials when storing and transporting.

If unit is to be stored for prolonged periods of time or within adverse environmental conditions, package appropriately in a plastic bag and seal.

NOTE: Prior to use, maintenance procedures and safety checks should be followed when pump unit is removed from storage and after transportation.

TROUBLE SHOOTING

- * If pump unit won't run and power switch light is green:
 - 1. Check pump cover latch to make sure it is properly secured by turning it clockwise. Adjust tubing if necessary.
 - 2. Check irrigation control filter to make sure it is secured to irrigation control port.
- * If pump unit won't run and power switch light is NOT green:
 - 1. Check electrical plug to make sure pump unit is properly plugged into electrical outlet.
 - 2. Depress red circuit breaker switch on back of pump unit and release. See figure 4, p.4.

- * If irrigation line leaks or drips when pump unit is not running:
 1. Make sure tubing is placed under tubing position indicator on sides of pinch clamp.
 2. Make sure pinch clamp switch is in DOWN position.
- * If pump unit activates when irrigation control filter is placed on irrigation control port:
 1. Tubing is blocked. Use new tubing set.
- * If pump unit operation exhibits delayed starting or stopping via handpiece activation:
 1. Adjust recessed set screw (see figure 4, p.4) with a screwdriver on back of pump unit for activation sensitivity.

NOTE: Pump unit will have to be activated and deactivated via irrigation control hole (see figure 7, p.5) on handpiece or irrigation control port (see figure 7, p.5) as adjustment is made.

USER/PATIENT SAFETY

- * DO NOT modify ground of power cord.
- * DO NOT operate in an explosive inflammable environment.

WARNING: The Stryker OrthoLav Pulsed Irrigation and Suction System is designed to be used by persons familiar with pulsatile lavage. Misuse may cause damage to both patient and pump unit. Prior to use pump unit and components should be inspected for any damage. DO NOT use if damage is apparent.

- * DO NOT modify interlocks.

230V CONVERSION

1. Rewire terminal strip as shown in figure 9.

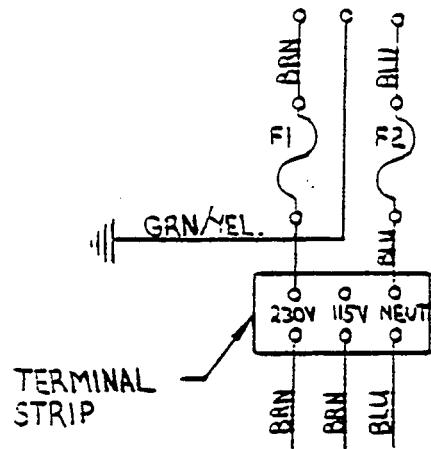


Figure 9

2. Remove source cord 110 V plug cap, Stryker part no. 460-2-69, and replace with 230 V plug cap, Stryker part no. 590-444-1. See Source Cord Plug Cap Exchange instructions, p. 11.

SOURCE CORD PLUG CAP EXCHANGE

Tools Required: Screw Driver.

- 1) Disconnect unit from power receptacle.
- 2) Plug Cap Removal from Source Cord:
 - a) Remove strain relief screws, if applicable.
(See Figure 10, Type 1 and 2).
 - b) Remove end cap screws.
 - c) Loosen wire clamp screws. Do not fully remove.
 - d) Remove wire from end cap.
 - e) Slide source cord out of plug cap housing.
 - f) Re-assemble pieces of the plug cap, and save for later use.
- 3) Plug Cap Assembly onto Source Cord:
 - a) Dis-assemble complete plug cap.
 - b) Slide source cord through plug cap housing.
 - c) Loosen clamp screws for wire insertion.
 - d) Insert green/yellow ground wire into ground screw clamp in end cap. Identified by green screw. The wire insulation should just contact the edge of the clamp. All strands of wire must be under the clamp. Tighten screw.
 - e) Insert blue neutral wire into silver colored clamp in end cap. (Note: polarity of blue and brown wires doesn't matter for 230V plugs, and therefore, the two live screws will be gold in color). The wire insulation should just contact the edge of the clamp. All strands of wire must be under the clamp. Tighten screw.
 - f) Insert brown live wire into gold colored clamp in end cap. The wire insulation shall just contact the edge of the clamp. All strands of wire must be under the clamp. Tighten screw.
 - g) Insert and tighten the end cap screws into the plug housing. (Plug caps of Figure 11, Type 3 have an integral strain relief and therefore the cord jacket must be approx. 1/2 in. into the plug housing before the end cap screws are tightened). Most plug caps and plug cap housings are keyed together and must be aligned properly.
 - h) Fasten strain relief cover to plug housing ensuring that the cord jacket is underneath the strain relief cover. (See Figure 10, Types 1 and 2).

FIGURE 10

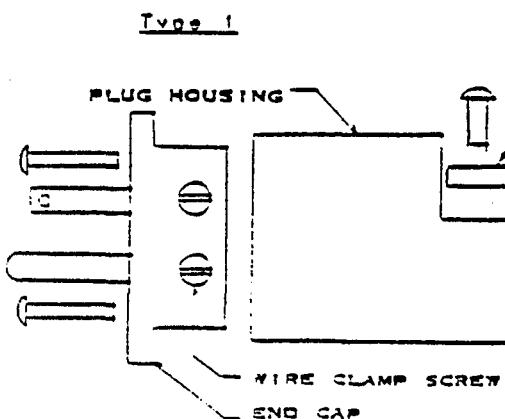
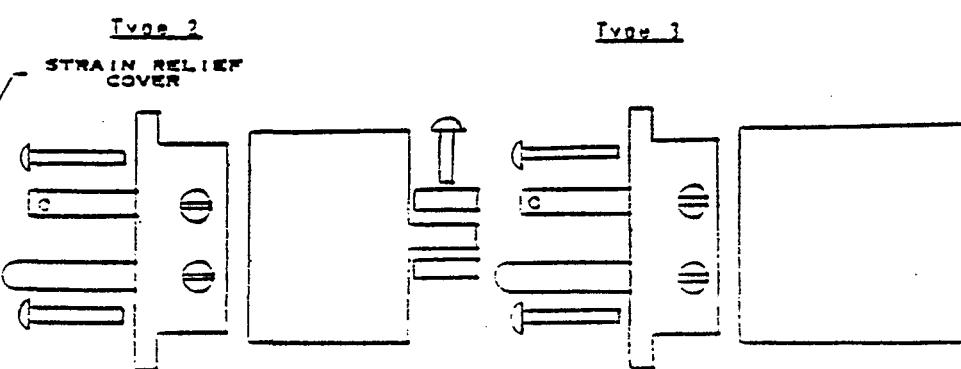
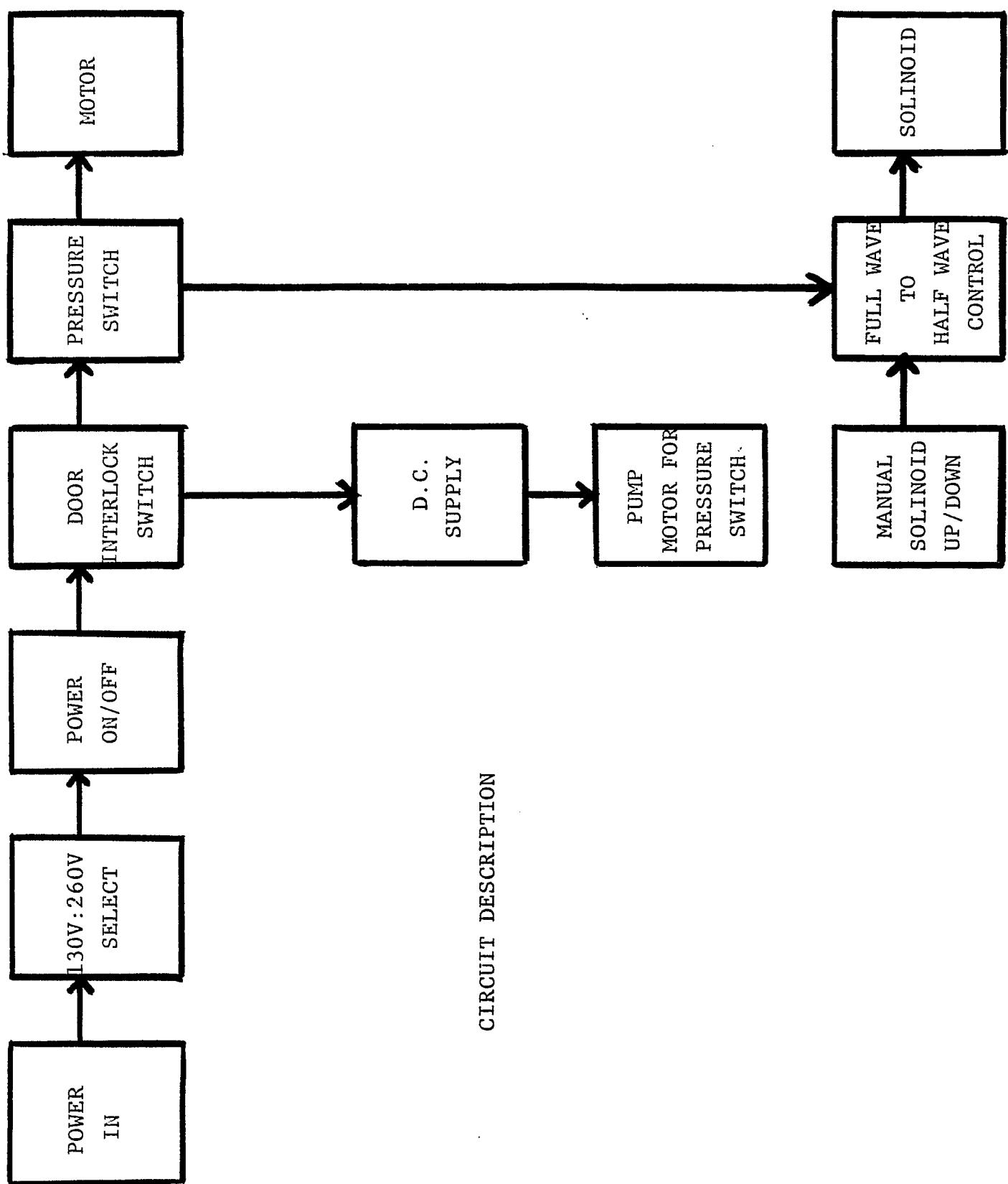
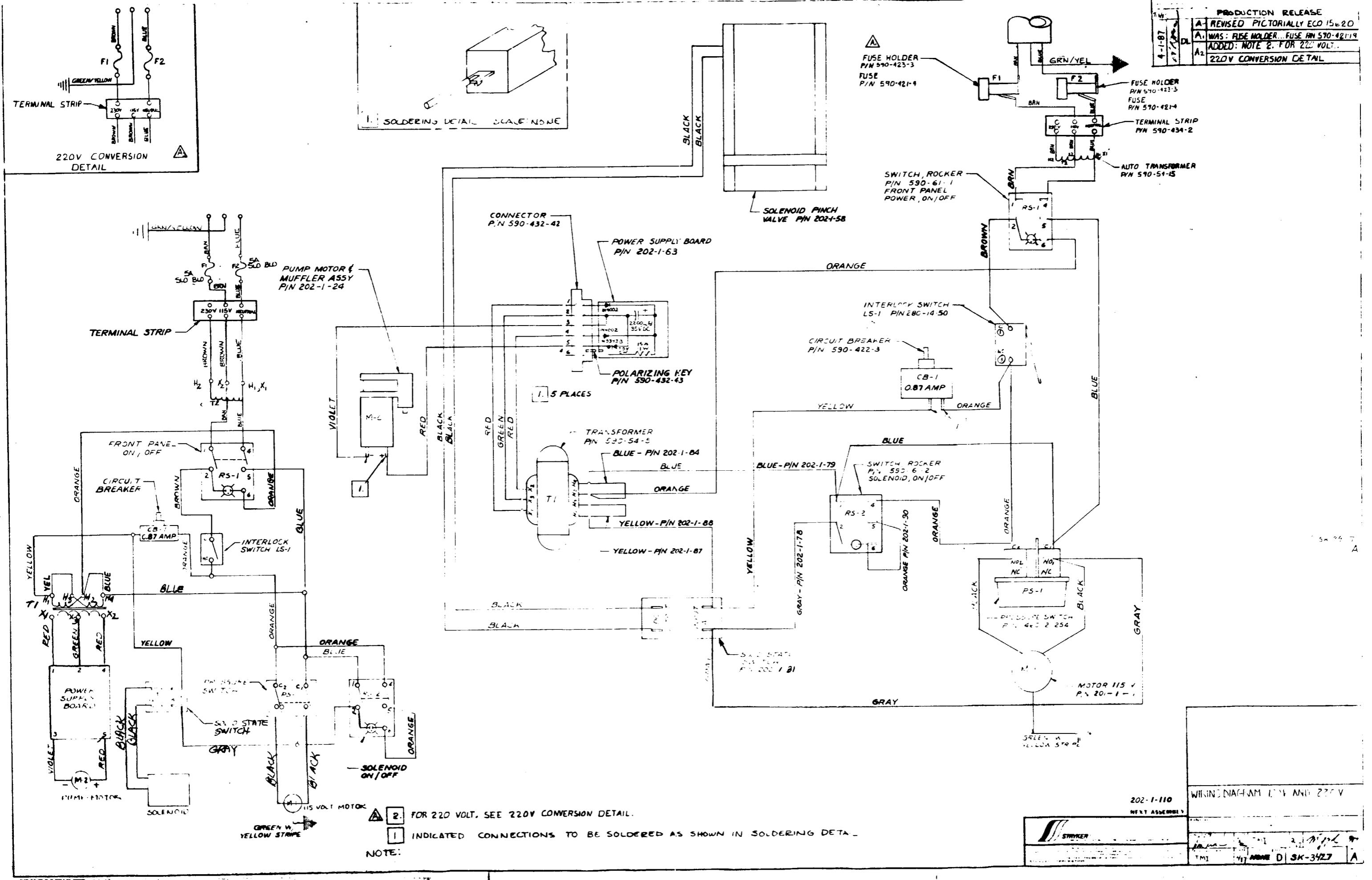


FIGURE 11

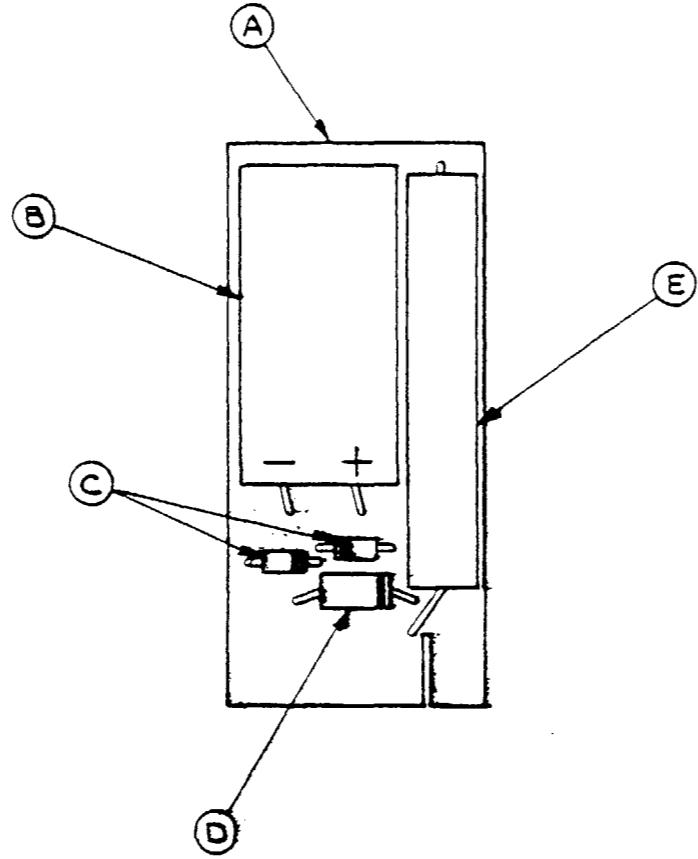




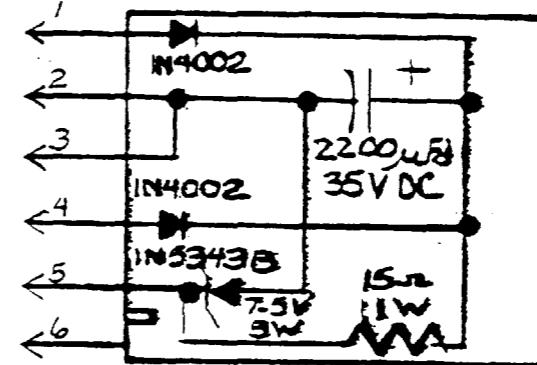
CIRCUIT DESCRIPTION



ITEM	PART NO.	PART NAME	NO. REQ'D.	DATE ISSUED	REV	REVISIONS
A	202-1-62	PRINTED CIRCUIT BOARD	1	7/7/81		PRODUCTION RELEASE
B	590-25-3	CAPACITOR	1			
C	590-56-5	DIODE	2			
D	590-57-3	ZENOR DIODE	1			
E	590-19-1	RESISTOR	1			



The diagram shows a printed circuit board (PCB) assembly. Point A points to the top edge of the PCB. Point B points to a capacitor component. Point C points to a diode component. Point D points to a resistor component. Point E points to the bottom edge of the PCB.



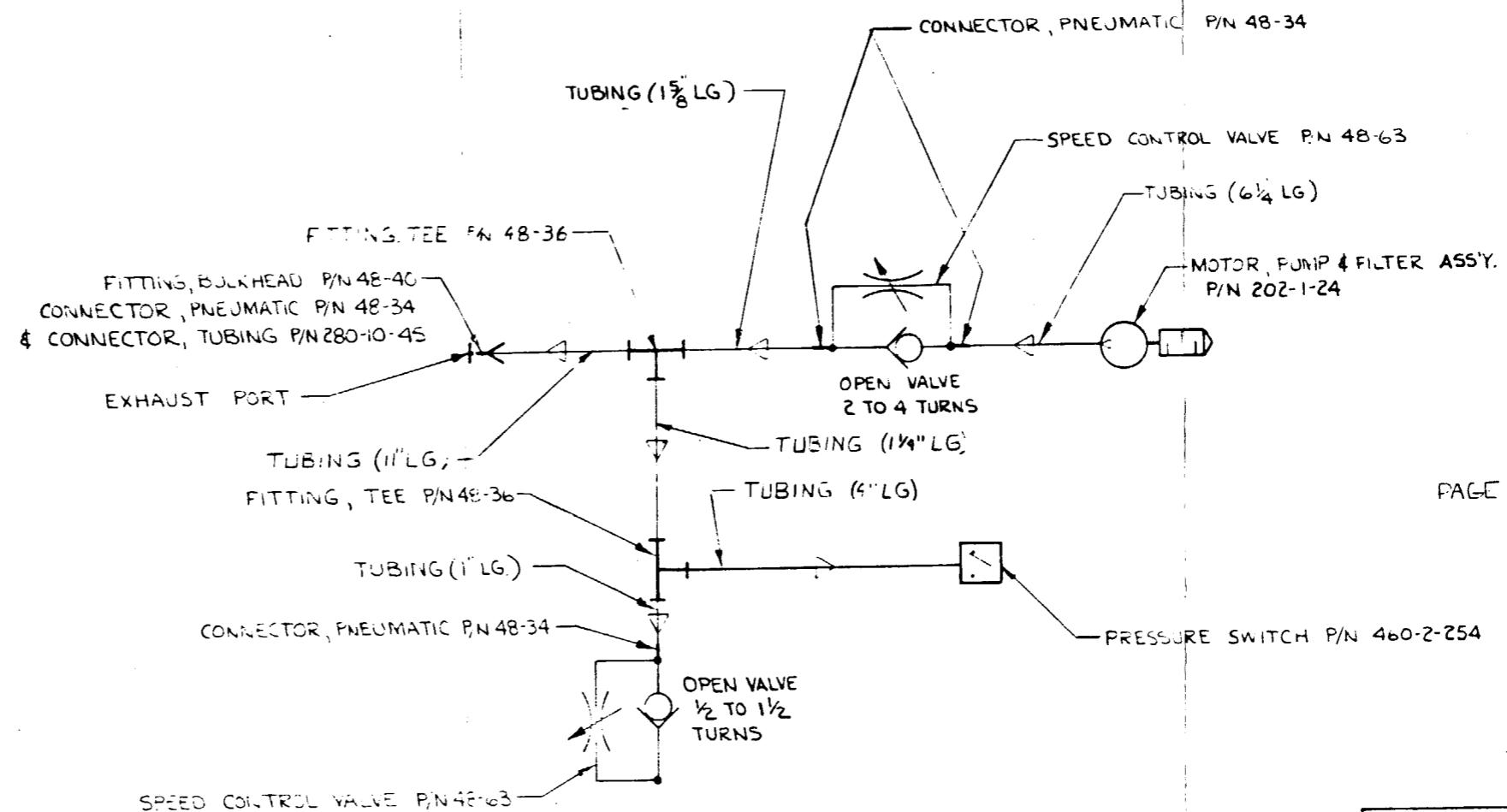
The circuit diagram illustrates the connections between components. It shows two IN4002 diodes connected in series with a 2200μF 35V DC capacitor. A 15Ω 1W resistor is connected in parallel across the output. The input signal is labeled with a frequency of 1. The output voltage is indicated as 7.5V 5W.

C 202-1-63

REQUIREMENTS FOR FINISHED PART UNLESS OTHERWISE SPECIFIED.
UNLESS SHOWN ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
TOLERANCES: (+/-0.005) DECIMAL, (+/-0.010) ANGULAR & L.
CONTINUOUS THREADS: (.005 TO .010) (.002 TO .020) CROWN ALLOY
PULL OUT STRESS INTERVAL: (.002 TO .020)
GENERAL FINISH: (.005 TO .010) (.002 TO .020)
THREAD CHAMFER: (.005 TO .010) (.002 TO .020) DEEP
SURFACE FINISH: CYLINDRICAL: (.005 TO .010) (.002 TO .020)
HOLES AND FEATURES TO BE ON SAME Q.C. AS BASE
ALL DRILLS APPLY
DEPOSIVE PLATING
GENERAL PLATING
ON ALL PLATED PARTS, CONTROLS
MATERIALS: (.005 TO .010) (.002 TO .020)
CONCENTRICITY: (.005 TO .010) (.002 TO .020)
PARALLELISM: (.005 TO .010) (.002 TO .020)
PLATE THICKNESS: (.005 TO .010) (.002 TO .020)
DO NOT SCALE DRAWINGS - IF SYMMETRY USE ONE
TITLE: P.C. BOARD ASSEMBLY
NEXT ASSEMBLY: 202-1-100
FINISH:
DRAWN BY: L. ROOT DATE: 10/2/81
DESIGNED BY: DATE: 10/2/81
SCALE: 1/4" SIZE: 211 C PART NO.: 202-1-63 REV: 1/2

NOTES:

- 1. SOLDER ALL CONNECTIONS WITH ROSIN CORE - 60/40 21 GAUGE SOLDER.
- 1. SEE SK- FOR ASSEMBLY INSTRUCTIONS.



PAGE 3 OF 3

C 202-100
B

1. WIRE PER WIRING DIAGRAM SK-3427.
NOTES:

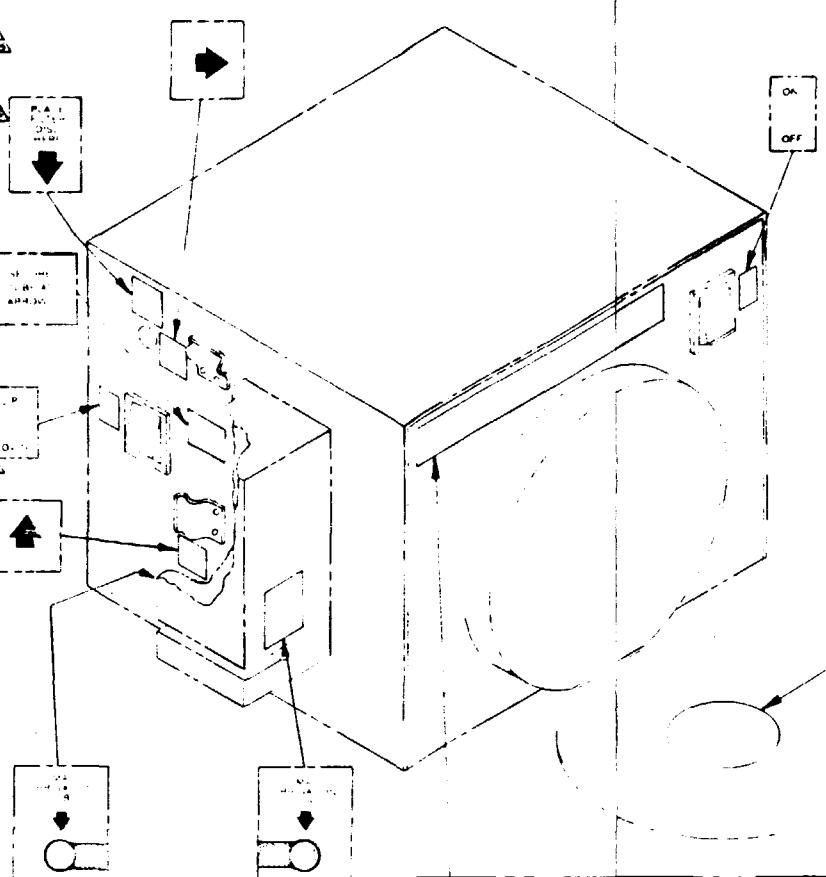
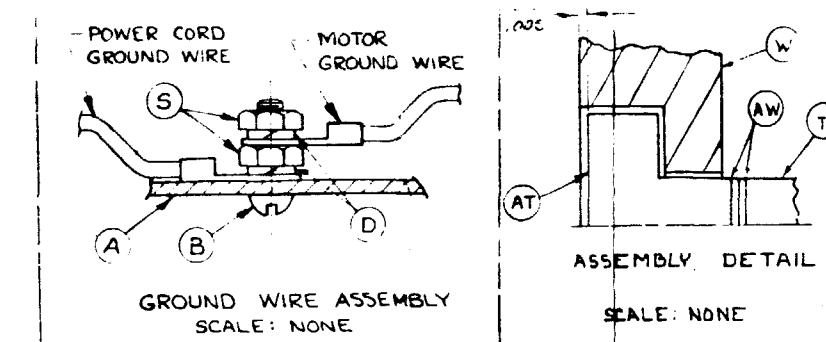
NEXT ASSEMBLY	
stryker	
REVISION	
HAAN	JMI
JMJ	NONE C 202-100

ORTOLAV, GOVT 120/220 V

A	BASE ASSEMBLY	202-1-11	1
B	RD. HD. MACH. SCR. (#6-32 X 1/2)	2-52	1
C	RD. HD. MACH SCREW (#6-32 X 3/8)	2-7	2
D	LOCK WASHER (.250 O.D.X.144 I.D.X.081 THK)	12-3	6
E	DOOR ASSEMBLY	280-14-4B	1
F	HEX NUT (#8-32)	15-2	12
H	I.V. HOLDER STD (NOT SHOWN)	390-25	1
J	FLAT WASHER (1/8 O.D.X.10 I.D.)	11-1	8
K	RUBBER FOOT	650-1-4B	4
L	RUBBER GROMMET	34-12	5
M	LOCK WASHER (.877 O.D.X.171 I.D.X.08)	12-15	2
N	SWITCH ROCKER	590-61-1	1
P	FLAT WASHER (1.000 O.D.X.250 I.D.X.065 THK)	11-53	8
R			1
S	HEX NUT (#6-32)	15-1	8
T	MOTOR	201-1-11	1
W	PUMP FACE ASSEMBLY MACHINED	280-14-2B	1
Z	HANDLE	201-1-34	1
AA	FIBER LOCK NUT (#10-32)	16-3	4
AB	HEX HD. CAP SCREW (#10-32 X 1)	3-48	4
AC	RD. HD. MACH. SCREW (#8-32 X 1/4)	2-34	8
AD	FLAT HD. MACH SCREW	1-3	4
AE	SPECIFICATION LABEL	202-1-105	1
AF	INSTRUCTION LABEL	202-1-17	1
AH	STRAIN RELIEF	34-14	1
AJ	FUSE, 5A, SLO BLO	590-421-4	2
AK	FLAT WASHER (.438 O.D.X.188 I.D.X.049)	11-16	2
AL	PLUG	4-0-2-69	1
AM	SPACER	202-1-61	2
AN	PERFORATED PLATE	202-1-59	1
AP	LABEL	201-1-70	1
AR	LABEL, FUSE SA	202-1-95	1
AS	PLASTIC ENCASED CORD TAG	280-4-97	1
AT	LABEL, CAUTION	856-2-44	1
AW	SHIM WASHER (.687 O.D.X.380 I.D.X.016 THK)	11-43	AE REOD
AZ	FITTING, BULKHEAD	48-40	1
BA	CONNECTOR PNEUMATIC	48-34	4
BB	CONNECTOR, TUBING	280-10-45	1
BC	PRESSURE SWITCH	280-2-144	1
BD	SH. METAL SCREW (#4-32 X 1/4)	1-1	-
BE	I.V. HOLDER ASSEMBLY	280-4-142	1
BF	INSERT	393-3-6B	1
DH	WIRING HARNESS	202-130-1	1
DJ	I.V. SUPPORT ASSEMBLY	280-4-141	1
DK	RETAINING RING (.812 O.D.X.010 THK)	2B-49	1
BL	BUSHING	280-4-21	1
DM	RD. HD. MACH. SCREW (#6-32 X 1/4)	2-64	2
BN	SOLENOID, PINCH VALVE	202-1-58	1
DP	HEX HD. MACH SCREW (#10-24 X 3/8)	3-52	4
DR	POP RIVET (1/8 X .294)	25-38	8
BS	SPRING CLIP	280-4-24	2
BT	CIRCUIT BREAKER ASS'Y	590-422-5	1
BW	MOTOR, PUMP & MUFFLER	202-1-24	1
DZ	SH. METAL SCREW (#6-32 X 3/8)	2B-8	2

E		202-1-11.3	ND. REG D
CA	LOCKWASHER	13-7	4
CB	POLARIZING KEY	590-432-43	1
CC	SPEED CONTROL VALVE	4B-63	2
CD	RD. HD. MACH SCREW (#8-32 X 5/8)	2-58	2
CE	LOCK WASHER (.250 O.D.X.171 I.D.X.040 THK)	12-18	4
CF	SWITCH, ROCKER	590-61-2	1
CH	BRACKET, RIGHT ANGLE	202-1-22	1
CJ	RD. HD. MACH SCREW (#8-32 X 3/8)	2-9	2
CK	TRANSFORMER	590-54-5	1
CL	RD. HD. MACH SCREW (#8-32 X 2-1/2)	2-71	2
CM	HEX NUT (#4-40)	15-19	4
CN	TERMINAL STRIP	590-434-2	1
CP	CARD POST GUIDE	590-205-2	2
CR	WASHER	11-65	4
CS	RD. HD. MACH SCREW #10-32 X 3/8	2-78	4
CT	FLAT HD. MACH. SCR. (#4-40)	1-413	2
CW	HOLE PLUG	37-21	1
CZ	PC BOARD ASSY	202-1-63	1
DA	SPACER	202-1-60	2
DB	EDGE CONNECTOR	590-432-42	1
DC	RETAINING RING	2B-44	1
DD	SOLID STATE SWITCH	202-1-31	1
DE	ECCENTRIC	201-1-12	1
DF	FUSE HOLDER	590-423-3	2
DH	SWITCH BRACKET	280-14-49	1
DJ	INTERLOCK SWITCH MACHINED	202-1-97	1
DK	RD. HD. MACH. SCREW (#4-40 X 1/4)	2-54	4
DL	LOCK WASHER (.192 O.D.X.116 I.D.X.020 THK)	12-1	6
DM	LOCK WASHER (.334 O.D.X.198 I.D.X.047 THK)	12-11	4
DN			1
	ROLLER ASSY	202-1-57	
DP	RD. HD. MACH. SCR. (#4-40 X 7/8)	2-72	2
DR	THRUST WASHER	81-183	3
DS	THRUST WASHER	81-173	2
DT	WIRE ASSY (NOT SHOWN)	252-1-82	1
DW	WIRE ASSY (NOT SHOWN)	12-1-78	1
DZ	WIRE ASSY (NOT SHOWN)	1202-1-78	1
EA	TRANSFORMER	590-54-15	1
EF	LOCK WASHER	13-1	8
EC	RD. HD. MACHINE SCREW	2-51	2
ED	INTERLOCK WASHER (.500 O.D.X.191 I.D.X.022)	13-4	1
EE	MOUNTING PAD	39-130	2
EF	CABLE TIE (1M. LENGTH)	38-31	2
EH	CABLE TIE (1M. LENGTH)	38-111	3
EL	HOUSING TRANSFORMER ASSY	202-1-60	1
EN	FITTING, TEE (NOT SHOWN)	12-1-81	2
EM	FITTING, TEE (25.125 MM)	12-1-82	1 REG
EN	FITTING, TEE (NOT SHOWN)	12-1-83	2

PRODUCTION RELEASE			
A.	REMOVED ITEM E2... 202-1-11.3	ECO	
A2	REMOVED ITEM AR 590-2-1-19	ECO	
A3	ADDED: NEW AR 202-1-95.1 REG	ECO	
A4	WAS: 590-2-1-4 ECO	ECO	
B.	REMOVED: ITEM H 3429. ECO 202-1-11.3	ECO	
B2	REMOVED: ITEM A... 202-1-11.3	ECO	
B3	WAS: ITEM C... 590-432-42...	ECO	
B4	WAS: ITEM C4... 1-15	ECO	
B5	ADD: ITEM H... 3429. ECO	ECO	

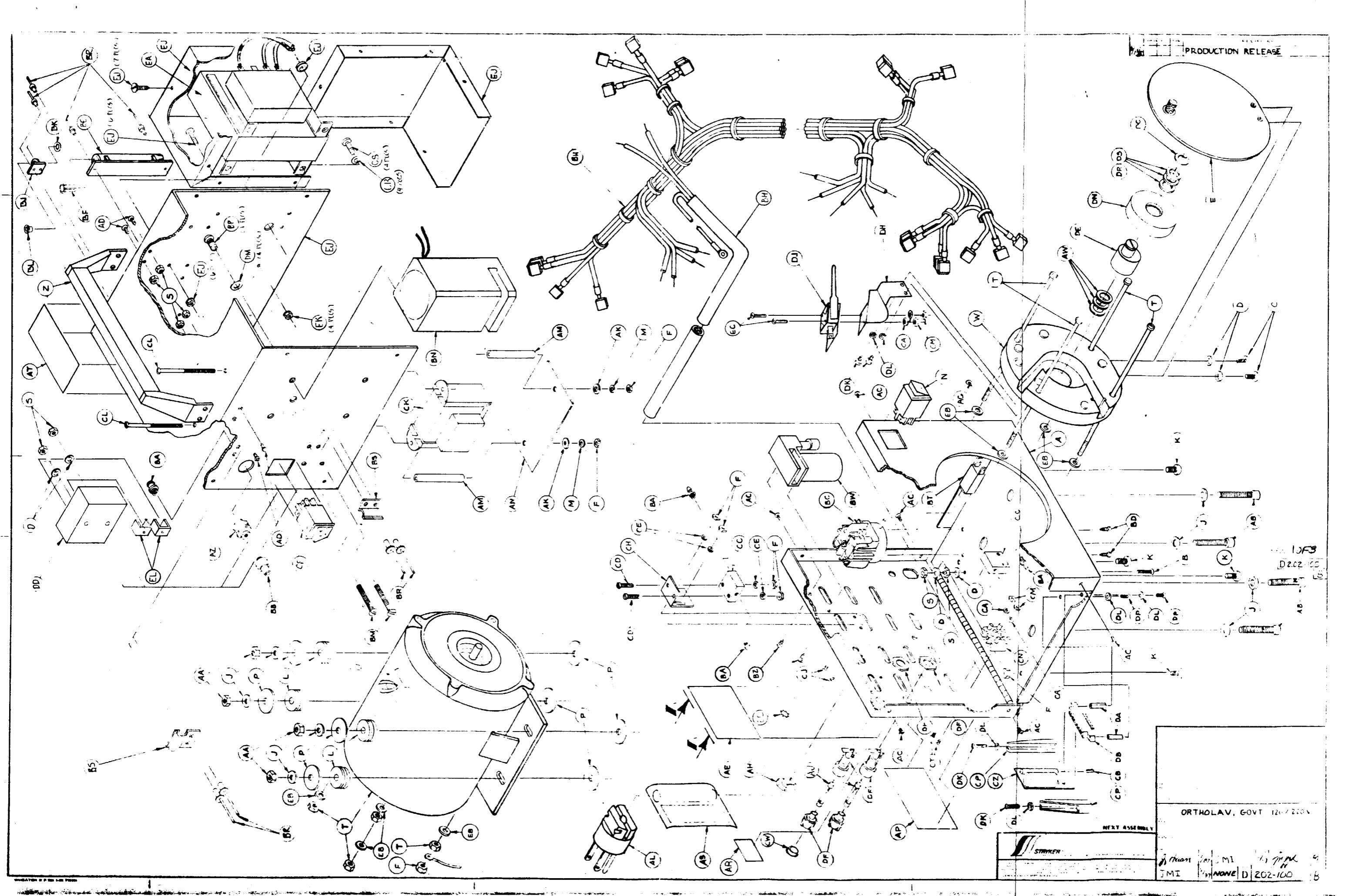


PAGE 2 OF 3

stryker OrthoLav

INSTRUCTION LABEL AF LOCATION DETAIL
SCALE: NONE

ION	FINAL GAP TO BE BETWEEN .107 MIN. /.121 MAX.	(W)	
ASSEMBLY DETAIL SCALE: NONE			
ORTHOLAV GUN TUBE ASSEMBLY			
NEXT ASSEMBLY			
STYKEN			
HAAN	1202-1-11.3	ECO	
TMI	1202-1-11.3	ECO	



SPECIFICATIONS

Dimensions: 10-1/2 x 10-1/2 x 16-1/2

Weight: 40 lbs.

Electrical:

Voltage	115	230
Frequency	60	50/60
Current	3.2 A	2.2/1.8
Fuse, Slo-Blo	5A	5A

REORDER INFORMATION

<u>Stryker Catalogue No.</u>	<u>National Standard No.</u>	<u>Description</u>
202-100	6530-1-237-6088	Ortholav Pump Unit
280-14-500	6530-1-184-1239	10 Sterile/Disposable Large Handpiece Tubing Sets
280-14-600	None	10 Sterile/Disposable Yankauer Multiple Orifice Tips
280-14-610	None	10 Sterile/Disposable Yankauer Single Orifice Tips
280-14-620	6515-1-238-9444	10 Sterile/Disposable Standard Femoral Canal Tips
280-14-630	None	10 Sterile/Disposable Straight Single Orifice Tips
280-14-640	6530-1-184-1240	10 Sterile/Disposable Straight Multiple Orifice Tips
280-14-650	None	10 Sterile/Disposable Femoral Canal Tips (Irrigation Only)
280-14-675	None	10 Sterile/Disposable Pulsatile Femoral Brush Tips
280-14-680	None	10 Sterile/Disposable Pulsatile Acetabular Brush Tips
280-14-700	None	10 Sterile/Disposable 6" Splash Guards
280-14-710	None	10 Sterile/Disposable 9" Splash Guards

LIMITED WARRANTY

Applies to U.S.A. only.

The Stryker Corporation Products are warranted to the original purchaser for a period of one year from the date of purchase to be free from defects in material and workmanship. This warranty extends to all purchasers and is limited to the repair or replacement of the product without charge when returned to Stryker Corporation, Surgical, 420 E. Alcott Street, Kalamazoo, Michigan 49001-6197. Stryker cannot accept responsibility for returns or replacements which have not been authorized.

This warranty does not cover damages caused by misuse or by failure to follow procedures outlined in this manual or as demonstrated by the Stryker Corporation representatives.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

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